

REMARKS

Entry of the amendment is respectfully requested since it introduces no new matter, would lessen the issues on appeal and reflects an earnest effort to advance prosecution. Reconsideration in light of the foregoing amendments and remarks which follow is respectfully requested.

Upon entry of the amendment, claims 7-8 and 10-16 are before the Examiner. Claims 3 and 4 have been cancelled and rewritten as claims 15 and 16, respectively. Claims 15 and 16 specify the surface modifying agents as being one or more of the compounds appearing in Table 5, appearing on page 28 of the specification. These claims are commensurate in scope with the results shown in Tables 5, 6 and the Rule 132 declaration previously submitted.

Claims 3, 5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al., JP 2000-169132 in view of the teachings taken from Chapter 6 of Handbook of Fillers (second edition) edited by Wypych, Herzig (U.S. Patent No. 4,101,499), Penneck (U.S. Patent No. 4,001,128) and Cyprien Guy et al. (U.S. Patent No. 4,886,661). Applicants respectfully traverse the rejection.

The arguments previously presented in prior responses are incorporated herein by reference.

The composition claims, upon entry of the amendment, differ from the previously rejected claims in that the surface modifying agents are limited to those of Table 5. The specification enumerates on page 13 certain advantages for the invention. In particular, it is stated in the last paragraph that as a result of the surface modification the products in accordance with the invention can be worked in "more rapidly" and in a "higher concentration" into organic

systems such as polyester resin. There are no Tables in the specification which set forth a numeric value with the properties "worked rapidly" and "in a higher concentration" for the surface modified doped pyrogenically produced product.¹

A previously submitted Rule 132 Declaration by Dr. Jürgen Meyer compares surface treated with non-surface treated product. The declarations shows a variety of "unexpected" properties for the surface treated potassium doped pyrogenically produced silica. The surface treating agent is hexamethyldisilane (Examples 5 and 6), which is claimed. It is stated in the last paragraph on page 7 (which continues onto page 8) that the hydrophilic starting products could be mixed in only in low concentration or not at all and in contrast, the products of Examples 5 and 6 show "easy intermingling", "extremely good wettability" and "low rheological properties". Further, on page 8, in the first complete paragraph, it is stated that the hydrophilic silic acids could not be "worked in" at the same concentrations as the products of Examples 5 and 6 because of an excessive thickening effect. See Table 5.

Table 6 of the declaration provides mechanical and optical characteristics of the vulcanized products with 20 % silicic acid. In paragraph 4, the results are characterized as "extraordinary" in terms of high transparence relative to other products. The Declarant considered this level of transparence as unexpected. The tear resistance of the products are also indicated as both "surprising and unexpected". In paragraph five, it is stated that the hydrophobic doped products show "good dispersability" and "intermingling" relative to the non-surface modified doped products.

¹ Table 2 shows Thickening in Ludopal (mPas) for the products prepared in Examples 1-3. These examples do not mention surface treatment.

The amended composition claims are commensurate in scope with the results shown in the declaration and described on page 13 of the specification.

Mangold et al. describe a pyrogenically produced silicon dioxide doped with aluminum oxide by means of an aerosol. The Mangold et al. doped silicon dioxide is characterized as extremely readily dispersible in polar media, such as water, and is further characterized as being highly suitable for use in inkjet paper and inkjet film applications.² See paragraph No. 7.³

There is no mention of surface modification which would lead to an hydrophobic surface. Moreover, Mangold et al. desires a hydrophilic surface, which appears necessary for the inkjet paper and inkjet film applications. Accordingly, it is not seen why one would modify the hydrophilic surface so that it is hydrophobic and not useful for the taught application.

Wypych is characterized by the Office as teaching that fillers typically have hydrophilic surfaces, that certain polymers are hydrophobic and that silanes have been taken a "lead " role as modifiers for inorganic fillers. There is no mention of the claimed surface modifiers.

Pyrogenically produced silica is mentioned in at the last line of Table 6.5, appearing on page 326, as "fumed silica". It is indicated that the modification with silanes cause a "decrease in specific interaction". There is no mention in Wypych of doped pyrogenically produced silica. There is no mention of ink jet applications.

² There is mentioned in paragraph 15 a laundry list of possible applications, one of which is a filler for polymers. There is no teaching provided in Mangold relative to the performance of this application or the others listed in the paragraph.

³ There is a mention of various "filler" uses, e.g. inkjet paper or other inkjet materials, etc., in paragraph No. 15. In paragraph No. 51, structure differences of the Mangold et al. product relative to OX 50, a commercially available silica, are discussed. The Mangold et al product is characterized as having very low DBP values. These low values are described as permitting the preparation of low viscosity dispersions. The possibility of dispersions having elevated filler content are mentioned. Table 3 (paragraph No. 57) contrasts the low and high surface area Mangold products with various commercially available pyrogenic oxide and mixed oxide products.

Herzig, Guy and Penneck are cited in combination as illustrating cyclosiloxanes, silazanes, oligomeric telechelic polysiloxanes, and other organosilicon compounds as compatibilizing agents for polymers.

Guy describes a heat vulcanized silicone dosage forms adapted for the continuous and controlled release of iodine values. The dosage forms are shaped from a diorganopolysiloxane matrix resin, an organohydropolysiloxane, a reinforcing amount of a filler, platinum group catalyst and an iodine compound. The dosage form is added to domestic water supplies. The filler can be pyrogenic silicas and precipitated silicas (see col. 8, lines 7 and 8). Guy does mention octyltrimethoxysilane (D4). There is no mention of pyrogenically produced oxides doped by an aerosol. There is no mention of an application akin to ink jet printers.

Pennick describes blended anti-tracking insulating material suitable for high voltage applications consisting of an organic synthetic polymeric material and an anti-tracking filler system. The anti-tracking filler system consists of alumina trihydrate and an organic silicon containing compound, which has been coated with one organosilicon compound. The silicon containing filler can be silica. See col.2, lin 39. One example is AEROSIL R 972. See col.8, last line. AEROSIL R 972 comprise fumed silica treated with dimethyldichlorosilane. There is no mention of pyrogenically produced oxides doped by an aerosol. There is no mention of a utility akin to an inkjet printer application. Pennick does mention PDMS.

Herzig describes a process for the preparation of a homogeneous distribution of highly disperse active fillers with a BET surface area of at least $50 \text{ m}^2/\text{g}$ in polyorganosiloxanes. The process entails forming a mixture of polyorganosiloxane, water and a modifying agent and

adding that to silica. Herzig mentions HMDS and PDMS. There is no teaching of a surface modified, doped by aerosol, pyrogenically produced oxides.

The Examiner has assembled references that teach the existence of various technologies. The examiner then asserts that it would be obvious to use these technologies to arrive at the claimed invention. There is not a problem solved by the secondary references, which appears to exist in the primary reference and which would suggest the combinability of the references. Further, the surface modification suggested in the secondary references would result in the creation of a hydrophobic surface, which is not desired in the primary reference and further would render the product unsuitable for the utility taught. The resulting product would not be extremely readily dispersible in polar media, such as water.

Further, as to the selection of one or more of octyltrimethoxysilane (Si 108), hexamethyldisilazane (HMDS), polydimethylsiloxane (PDMS) and γ -aminopropyltriethoxysilane (AMEO) as the surface modifying agent, there is no guidance provided which would have lead one to make the necessary choice.

Withdrawal of the rejection is respectfully requested since a prima-facie case has not been established.

Further it is respectfully requested that the Examiner revisit the propriety of the rejection in light of the results shown in the Rule 132 declaration. It is not clear from the record the Examiner's reasoning as to why the art of record would suggest the results established by the declaration.

The art may suggest better "solubility" of the treated particles in a hydrophobic environment. This by itself does not establish the possibility of high concentration (20 %) of the

particles of the invention in a liquid silicone rubber formulation, low rheological properties (Table 5), easy intermingling, and extremely good wettability. Vulcanization of this formulation leads to highly desirable properties- resistance to tear and extraordinary high transparency. Dr. Jürgen Myer opined that these results were surprising and unexpected. The examiner has only based his finding of "expected" results on mere speculation. No basis has even been provided as to the operation at high concentrations or the low viscosities present when these high concentrations were used. It is respectfully requested that the Examiner provide a factually based rationale as to his findings so that Applicants may meaningfully address his concerns.

Claims 3-5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemme et al., U.S. patent application Publication No. 2002/0018741 in view of the teachings taken from Chapter 6 of Handbook of Fillers (second edition) edited by Wypych, Herzig (U.S. Patent No. 4,101,499), Penneck (U.S. Patent No. 4,001,128) and Cyprien Guy et al. (U.S. Patent No. 4,886,661). Applicants respectfully traverse the rejection.

Hemme et al. teach a pyrogenically prepared titanium dioxide doped with aluminum oxide (see Examples 1, 9 and 17). The doped titanium dioxide may be used as a photocatalyst or as a UV adsorber. The photocatalytic activity is characterized as suitable for the degradation of impurities in waste water or waste air. See paragraph No. 22.⁴

⁴ The doped titanium is suspended in the waste water and placed on a support when used to treat waste air. When the doped titanium dioxides have low photocatalytic activity, they may be used as an adsorbent for UV radiation. As an adsorbent for UV radiation, they may be used in the coating of glasses or in plastics. See paragraph No. 23. A higher degree of doping contributes towards lowering photocatalytic activity. See paragraph 29. Surface area of the doped titanium dioxide may also impact photocatalytic activity. See paragraphs No. 30 and No. 31. The focus of the patent is on the photocatalytic activity, a surface effect, and its use to degrade chlorinated hydrocarbons.

There is no mention of the doped titanium dioxide in Hemme et al. to reinforce plastics.⁵

There is no mention of a need for surface modification of the Hemme et al. product. There is no mention of treating the Hemme et al. doped titanium dioxide surface with a silane.

The secondary references appear to be relied upon in a similar fashion as above.

The Examiner has again assembled references to show the existence of various technologies. The examiner then posits that it would have been obvious to assemble these technologies, without any guidance or motivation to arrive at the claimed invention.

The secondary references do not suggest that an aluminum oxide doped, pyrogenically produced titanium dioxide would be useful as a reinforcing filler in organic systems. The secondary references do not suggest that there is a problem present in Hemme et al for which their taught solution is the answer. Further, the secondary references do not suggest the suitability of the Hemme et al. product to reinforce plastics and the need to make surface modification that would render the surface hydrophobic. Also the secondary references do not suggest the selection of any one of octyltrimethoxysilane (Si 108), hexamethyldisilazane (HMDS), polydimethylsiloxane (PDMS) and γ -aminopropyltriethoxysilane (AMEO) as a surface modifying agent.

Withdrawal of the rejection is respectfully requested since a prima-facie case has not been established.

⁵ There is mention in paragraph 23 that the pyrogenically prepared aerosol doped titanium dioxide can be included in a coating or in a plastic. There is, however, no mention of a need for a treatment that would impart a hydrophobic surface.

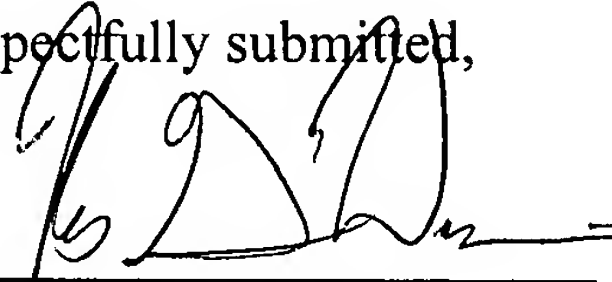
Further, the Rule 132 declaration, discussed above, should be considered here. Two products, which fall within the scope of the claims, are identified in Table 4. These surface modified pyrogenic silicic acid products are contrasted with hydrophilic pyrogenic silicic acid products (no surface modifications). See page 7 of the declaration. The use of these products in vulcanized products resulted in unexpected properties - transparency and tear resistance. See Table 6. The products are also observed as imparting extremely low viscosities and yield points. It is submitted that the claims are commensurate in scope with these showings.

It is submitted that the references, taken alone or in combination do not establish a proper prima facie case. However, should the Examiner deem a prima facie case to exist, the results shown in the Rule 132 declaration should be considered as rebutting such a case. Withdrawal of the rejection is respectfully requested.

Should the Examiner not find the Application to be in allowable condition or believe that a conference would be of value in expediting the prosecution of the Application, Applicants request that the Examiner telephone the undersigned Counsel to discuss the case and afford Applicants an opportunity to submit any Supplemental Amendment that might advance prosecution and place the Application in allowable condition.

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Respectfully submitted,



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